

Microsoft



Power BI's

Capstone Project

in Bank Loan

Performance

Analysis

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Bank Loan Performance Analysis



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Bank Loan Performance Analysis



Introduction:

Bank loan performance analysis is a critical process that evaluates the financial health and risk of a bank's loan portfolio. It involves assessing the quality, profitability, and risk of individual loans and the overall portfolio.

Relationship between Bank and Loan is crucial for economic growth, allowing individuals and businesses to access capital, manage finances, and achieve goals.

A loan is a financial agreement where one party (lender) provides money to another party (borrower) for a specific period, with the expectation of repayment, usually with interest.

There are various types of loans, including secured loans (e.g., mortgages, car loans), unsecured loans (e.g., credit cards, personal loans), short-term loans (e.g., payday loans), and long-term loans (e.g., mortgages, business loans). Loans can be used for personal purposes (e.g., education, wedding), business expansion, or debt consolidation.

Loan benefits include access to funds for specific needs, flexibility in repayment terms, opportunity for credit score improvement, and tax benefits (e.g., mortgage interest deduction)

However, loans also carry risks, such as default (failure to repay), interest rate changes, collateral loss (secured loans), debt accumulation, and credit score impact.

In loan terminology, an installment refers to a scheduled payment made by a borrower to repay a loan.



Bank Loan Performance Analysis



Key Aspects:

1. Banking:

- Fixed Amount: Installments are typically fixed amounts paid at regular intervals.
- Frequency: Payments can be monthly, quarterly, semi-annually, or annually.
- Repayment Period: Installments are spread over the loan's repayment term.
- Interest and Principal: Each installment covers interest and principal amounts.

2. Loans:

❖ Types:

- Personal (e.g., mortgages, credit cards)
- Commercial (e.g., business lines, term loans)
- Industrial (e.g., equipment financing)

❖ Characteristics:

- Principal (amount borrowed)
- Interest rate
- Tenure (repayment period)
- Collateral (security)

3. Loan Classification:

- Performing loans
- Non-performing loans (NPLs)
- Past-due loans
- Restructured loans



Bank Loan Performance Analysis



4. Loan Evaluation Criteria:

- Creditworthiness (credit score)
- Debt-to-income ratio
- Loan-to-value ratio
- Cash flow analysis
- Collateral value

5. Loan Products:

- Term loans
- Revolving credit (e.g., credit cards)
- Line of credit
- Mortgage loans
- Lease financing

6. Bank Loan Processes:

- Application and approval
- Disbursement
- Repayment and monitoring
- Risk assessment and management

7. Regulatory Framework:

- Basel Accords
- IFRS 9 (Financial Instruments)
- CECL (Current Expected Credit Loss) model
- Local banking regulations



Bank Loan Performance Analysis



The relationship between a bank and a loan is that of a lender and borrower. Here's a breakdown:

Bank's Role:

- Lender: Provides funds to borrowers.
- Credit Assessment: Evaluates loan applications, creditworthiness, and risk.
- Loan Origination: Disburses loan amounts to approved borrowers.
- Interest Collection: Earns interest on loaned funds.
- Risk Management: Monitors loan repayment, manages default risk.

Loan's Role:

- Borrower: Receives funds from bank.
- Debt Obligation: Commits to repaying loan principal + interest.
- Repayment Schedule: Agrees to regular installments.
- Collateral (optional): Offers security for loan (e.g., mortgage, collateral-based loans).

Here are some more relatable aspects of the bank-loan relationship:

Bank's Perspective:

- Risk vs. Reward: Balancing lending risks with potential interest income.
- Customer Acquisition: Attracting and retaining borrowers.
- Portfolio Diversification: Managing loan types and risk levels.
- Regulatory Compliance: Adhering to lending laws and regulations.
- Customer Service: Providing support and resolving issues.

Borrower's Perspective:

- Financial Goals: Achieving objectives like homeownership, education, or business growth.
- Repayment Stress: Managing loan repayments and interest.
- Credit Score Impact: Maintaining a healthy credit history.
- Flexibility: Negotiating loan terms and conditions.
- Trust and Security: Feeling confident in the bank's stability and integrity



Bank Loan Performance Analysis

Professional specialty



Scope Statement:

In today's data-driven world, understanding how borrower details and loan characteristics impact loan performance is very important for banking institutions. This project seeks to delve deep into a lending loan dataset to uncover the relationship between borrower behavior (such as employment length, income, and debt-to-income ratio) and loan characteristics (including amount, term, and interest rate) to unearth critical insights into loan performance metrics. By examining patterns in loan statuses such as fully paid, charged off, or late payments, this analysis aims to empower banking institutions with actionable insights to optimize loan lending strategies, mitigate credit risk, and enhance overall portfolio performance.

Dataset Download:

<https://drive.google.com/uc?export=download&id=1yNL9gfv-DID3cEW9o2GJvtJ9Bzbm37R7>

The dataset "bank loan.xlsx" contains two sheets:

- **Loan Details:** This sheet contains information about each loan.
- **Borrower Details:** This sheet provides details about the borrowers.

Bank Loan Performance Analysis



Data Catalog:

LOAN DETAILS	id	Unique identifier for each loan
	loan_amnt	The amount of money requested by the borrower.
	funded_amnt	The actual amount of money funded for the loan.
	term	The duration of the loan in months.
	LoanDetails	subgrade assigned by the lending company
	int_rate	The interest rate of the loan.
	installment	The monthly payment owed by the borrower.
	grade	The loan grade assigned by the lending company.
	sub_grade	The loan subgrade assigned by the lending company.
	issue_d	The month in which the loan was funded
	purpose	The reason provided by the borrower for the loan

Bank Loan Performance Analysis



BORROWER DETAILS

id	Unique identifier for each loan
member_id	Unique identifier for each borrower.
emp_length	Employment length in years.
home_ownership	The status of home ownership reported by the borrower.
annual_inc	The annual income reported by the borrower.
verification_status	Indicates if the borrower's income was verified.
dti	The debt-to-income ratio of the borrower.
delinq_2yrs	The number of past-due incidences in the borrower's credit file.
last_pymnt_d	The month of the last payment received
total_pymnt	The total amount received in payments
out_prncp	The remaining outstanding principal amount of the loan



Bank Loan Performance Analysis

Objective of the Study:



Two Insightful Reports:

- ★ Report 1: **Loan Performance Analysis**
- ★ Report 2: **Borrower Profile Analysis**

Loan Performance Analysis:

The Loan Performance Analysis report provides a comprehensive review of loan performance, analyzing key factors such as loan size, status, duration, interest rate, and loan objective.

Borrower Profile Analysis:

The Borrower Profile Analysis report aims to provide insights into the characteristics of borrowers such as home ownership, annual income, employment length, verification status, debt-to-income ratio, and delinquency history.

General Instructions for Report:

- ❖ Ensure each report and its charts are titled appropriately for easy identification.
- ❖ Maintain a clean and professional layout throughout both reports.
- ❖ Format and customize the charts to enhance visual appeal and comprehension.
- ❖ Utilize slicers for dynamic data exploration and filtering.
- ❖ Add tooltips to provide additional context and details for data points when hovered over.
- ❖ Include a summary or key insights section in each report to highlight main findings and observations.

Bank Loan Performance Analysis



Methodology:

1) Importing Data

- ❖ Import the "Loan Details" and "Borrower Details" sheets from the "bank loan.xlsx" file into Power BI.

2) Transformation Using Power Query

❖ Data Cleaning:

➤ Handling Missing Values and Duplicates:

- ✓ Replace missing values (null) in the 'emp_length' column of the "Borrower Details" table with '0 year'.
- ✓ Remove rows with missing values in the 'last_pymnt_d' and 'delinq_2yrs' columns.
- ✓ Remove duplicate rows in the 'id' column of the "Loan Details" table.

➤ Dealing with Inconsistencies:

- ✓ Ensure words in the 'purpose' column are separated by spaces instead of underscores (e.g., "credit card" instead of "credit_card").
- ✓ Format the 'purpose' and 'home_ownership' columns to proper case.

❖ Data Transformation:

➤ Column Transformation:

- ✓ Change the data type of the 'total_pymnt' column to 'Fixed decimal number'.
- ✓ Round off the numbers in the 'funded_amnt' column to 2 decimal places.

➤ Column Renaming:

- ✓ Rename the column 'issue_d' to 'issue_date'.
- ✓ Rename the column 'last_pymnt_d' to 'last_pymnt_date'.

➤ Creating New Columns:

- ✓ Create a new custom column named 'total_amount_paid' to calculate the total amount paid by each borrower by subtracting 'out_prncp' from 'total_pymnt'.
- ✓ Add a new conditional column named 'delinquency_status' to identify if the borrower has any delinquencies. If the number of delinquencies in 'delinq_2yrs' is greater than 0, the status should be "Delinquent", otherwise "Not Delinquent".

➤ Column Dropping:

- ✓ Remove the 'sub_grade' column as that does not significantly contribute to the analysis.

Bank Loan Performance Analysis



3) Data Modeling

- ❖ Identify the common column between both the tables and establish relationships between the two tables. Ensure the cross-filter direction is set to "Both". This step is crucial for enabling cross-table analysis and ensuring data integrity within the dataset

4) Creating Measures and Calculated Columns using DAX

- ❖ Create a new calculated column named 'remaining_installments' using DAX in the "BorrowerDetails" table to calculate the number of remaining installments by dividing the remaining principal amount ('out_prncp') by the monthly installment amount ('installment') and round up the result using the CEILING() function to account for any partial payments.
- ❖ Create a measure named 'Non-Verified Borrowers Count' using DAX to count the number of loans that have been 'Not Verified'.
- ❖ Create a measure named 'Fully Paid Loan Percentage' to calculate the percentage of fully paid loans. Divide the number of loans with a "Fully Paid" loan status by the total number of loans and then format this measure as Percentage.

5) Creating Comprehensive Reports:

Report 1: Loan Performance Analysis

The Loan Performance Analysis report aims to provide insights into the performance of loans based on various factors such as loan amount, loan status, term, interest rate, and purpose.

- ❖ **Total Funded Amount:** Create a card visual to display the total funded amount.
- ❖ **Fully Paid Loan Percentage:** Create a gauge chart to display the 'Fully Paid Loan Percentage' measure.
- ❖ **Average Interest Rate by Term:** Create a multi-row card to show the average interest rate for each term.
- ❖ **Loan Status Distribution:** Create a pie chart to visualize the sum of total payments by loan status.
- ❖ **Loan Amount by Purpose:** Create a treemap to show the average loan amount by purpose.
- ❖ **Installment Over Time:** Create a line chart to visualize the sum of installments by Year and Quarter of the issue date.
- ❖ **Maximum Total Amount Paid by Loan Status:** Create a column chart to display the maximum total amount paid by loan status.
- ❖ **Minimum Annual Income by Grade:** Create a funnel chart to show the minimum annual income by grade.

Bank Loan Performance Analysis



- ❖ **Issue Date Slicer:** Add a slicer for the Month of the issue date to enable dynamic data exploration.

Report 2: Borrower Profile Analysis

The Borrower Profile Analysis report aims to provide insights into the characteristics of borrowers such as home ownership, annual income, employment length, verification status, debt-to-income ratio, and delinquency history.

- ❖ **KPI Visual:** Create a KPI visual with the sum of total payment as the value, the year of last payment date as the trend axis, and the sum of loan amount as the target. Round off to 2 decimal points and format as \$ currency.
- ❖ **Average of Annual Income:** Display the average of annual income using a card visual.
- ❖ **Non-Verified Borrowers Count:** Display the count of non-verified borrowers using a card visual.
- ❖ **Average Debt-to-Income by Delinquency Status:** Create a multi-row card to show the average debt-to-income ratio by delinquency status.
- ❖ **Sum of Loan Amount by Home Ownership:** Create a table to show the total loan amount by home ownership.
- ❖ **Average Remaining Principal by Verification Status:** Create a donut chart to display the average remaining outstanding principal by verification status.
- ❖ **Sum of Delinquencies by Home Ownership:** Create a bar chart to show the total number of delinquencies in the past 2 years by home ownership and filter the visual to display only Mortgage, Rent, and Own.
- ❖ **Max Remaining Installments by Employment Length:** Create a tree map to show the maximum remaining installments by employment length.
- ❖ **Total Amount Paid and Funded Amount Over Time:** Create a line chart to display the sum of total amount paid and the sum of funded amount by the year of last payment date.
- ❖ **Purpose Slicer:** Add a slicer for loan purpose to enable dynamic data exploration.

Bank Loan Performance Analysis

Data Evaluation and Key Findings:



1. Data acquisition:

"Import the 'Loan Details' and 'Borrower Details' worksheets from the 'bank loan.xlsx' Excel file into Power BI for analysis."

<https://drive.google.com/uc?export=download&id=1yNL9gfv-DlD3cEW9o2GJvtJ9Bzbm37R7>

The screenshot displays the Power BI Desktop interface. The 'Navigator' pane on the left shows the 'bank loan.xlsx [2]' file with 'BorrowerDetails' and 'LoanDetails' tables selected. The 'Visualizations' pane on the right is empty. The main area shows a preview of the 'LoanDetails' table, which contains 20 rows of loan data. The table has columns for 'id', 'loan_amnt', 'funded_amnt', 'term', 'int_rate', and 'installment'.

id	loan_amnt	funded_amnt	term	int_rate	installment
1077501	5000	4975	36 months	10.65	
1077430	2500	2500	60 months	15.27	
1077175	2400	2400	36 months	15.96	
1076863	10000	10000	36 months	13.49	
1075358	3000	3000	60 months	12.69	
1075269	5000	5000	36 months	7.9	
1069639	7000	7000	60 months	15.96	
1072053	3000	3000	36 months	18.64	
1071795	5600	5600	60 months	21.28	
1071570	5375	5350	60 months	12.69	
1070078	6500	6500	60 months	14.65	
1069908	12000	12000	36 months	12.69	
1064687	9000	9000	36 months	13.49	
1069866	3000	3000	36 months	9.91	
1069057	10000	10000	36 months	10.65	
1069759	1000	1000	36 months	16.29	
1065775	10000	10000	36 months	15.27	
1069971	3600	3600	36 months	6.03	
1062474	6000	6000	36 months	11.71	
1069742	9200	9200	36 months	6.03	
1069740	20250	19142.16108	60 months	15.27	
1039153	21000	21000	36 months	12.42	

Bank Loan Performance Analysis



2. Transformation Using Power Query:

Data cleaning and preparation in Power Query.

✓ Data Cleaning:

Handling Missing Values and Duplicates:

- ❖ Replace missing values (null) in the 'emp_length' column of the "Borrower Details" table with '0 year'.

Query Settings

PROPERTIES

Name: BorrowerDetails

APPLIED STEPS

- Source
- Navigation
- Promoted Headers
- Changed Type
- Replaced Value null to 0

- ❖ Remove rows with missing values in the 'last_pymnt_d' and 'delinq_2yrs' columns.

Query Settings

PROPERTIES

Name: BorrowerDetails

APPLIED STEPS

- Source
- Navigation
- Promoted Headers
- Changed Type
- Replaced Value null to 0
- Filtered Rows

Bank Loan Performance Analysis



- ❖ Remove duplicate rows in the 'id' column of the "Loan Details" table.

Query: `= Table.Distinct(#"Changed Type", {"id"})`

	id	loan_amnt	funded_amnt	term	int_rate	installment
1	1077501	5000	4975	36 months	10.65	
2	1077430	2500	2500	60 months	15.27	
3	1077175	2400	2400	36 months	15.96	
4	1076863	10000	10000	36 months	13.49	
5	1075358	3000	3000	60 months	12.69	
6	1075269	5000	5000	36 months	7.9	
7	1069639	7000	7000	60 months	15.96	
8	1072053	3000	3000	36 months	18.64	
9	1071795	5600	5600	60 months	21.28	
10	1071570	5375	5350	60 months	12.69	
11	1070078	6500	6500	60 months	14.65	
12	1069908	12000	12000	36 months	12.69	
13	1064687	9000	9000	36 months	13.49	
14	1069866	3000	3000	36 months	9.91	
15	1069057	10000	10000	36 months	10.65	
16	1069759	1000	1000	36 months	16.29	
17	1065775	10000	10000	36 months	15.27	
18	1069971	3600	3600	36 months	6.03	
19	1062474	6000	6000	36 months	11.71	
20	1069742	9200	9200	36 months	6.03	
21	1069740	20250	19142 16108	60 months	15.27	
22	1039153	21000	21000	36 months	12.42	
23	1069710	10000	10000	36 months	11.71	
24	1069700	10000	10000	36 months	11.71	
25	1069559	6000	6000	36 months	11.71	

Query Settings: PROPERTIES: Name: LoanDetails. APPLIED STEPS: Source, Navigation, Promoted Headers, Changed Type, Removed Duplicates.

✓ Dealing with Inconsistencies:

- ❖ Ensure words in the 'purpose' column are separated by spaces instead of underscores (e.g., "credit card" instead of "credit_card").

</

Bank Loan Performance Analysis



❖ Format the 'purpose' and 'home_ownership' columns to proper case.

Query Settings

Table.TransformColumns(#"Filtered Rows",{{"home_ownership", Text.Proper, type text}})

id	home_ownership	annual_inc	verification_status	dti	delinq_2yrs
1	Rent	24000	Verified		27.65
2	Rent	30000	Source Verified		1
3	Rent	12252	Not Verified		8.72
4	Rent	49200	Source Verified		20
5	Rent	80000	Source Verified		17.94
6	Rent	36000	Source Verified		11.2
7	Rent	47004	Not Verified		23.51
8	Rent	48000	Source Verified		5.35
9	Own	40000	Source Verified		5.55
10	Rent	15000	Verified		18.08
11	Own	72000	Not Verified		16.12
12	Own	75000	Source Verified		10.78
13	Rent	30000	Source Verified		10.08
14	Rent	15000	Source Verified		12.56
15	Rent	100000	Source Verified		7.06
16	Rent	28000	Not Verified		20.31
17	Rent	42000	Not Verified		18.6
18	Mortgage	110000	Not Verified		10.52
19	Mortgage	84000	Verified		18.44
20	Rent	77385.19	Not Verified		9.86
21	Rent	43370	Verified		26.53
22	Rent	105000	Verified		13.22
23	Own	50000	Source Verified		11.18
24	Rent	50000	Not Verified		16.01
25	Rent	76000	Not Verified		2.4

Applied Steps: Capitalized Each Word in Home Ownership

PREVIEW DOWNLOADED AT 10:38

✓ Data Transformation:

❖ Column Transformation:

1. Change the data type of the 'total_pymnt' column to 'Fixed decimal number'.

Query Settings

Table.TransformColumnTypes(#"Capitalized Each Word in Home Ownership",{{"total_pymnt", Currency.Type}})

status	dti	delinq_2yrs	last_pymnt_d	total_pymnt	out_prncp
1	27.65	0	01-01-2015	5,861.07	
2	1	0	01-04-2020	1,008.71	
3	8.72	0	01-06-2021	3,003.65	
4	20	0	01-01-2015	12,226.30	
5	17.94	0	01-01-2016	3,242.17	76
6	11.2	0	01-01-2015	5,631.38	
7	23.51	0	01-01-2016	8,136.84	1889
8	5.35	0	01-01-2015	3,938.14	
9	5.55	0	01-04-2019	646.02	
10	18.08	0	01-11-2019	1,476.19	
11	16.12	0	01-06-2020	7,677.52	
12	10.78	0	01-09-2020	13,943.08	
13	10.08	0	01-07-2019	2,270.70	
14	12.56	0	01-01-2015	3,478.98	
15	7.06	0	01-10-2020	7,471.99	
16	20.31	0	01-01-2015	1,270.17	
17	18.6	0	01-01-2015	12,519.26	
18	10.52	0	01-05-2020	3,785.02	
19	18.44	2	01-02-2015	7,164.50	
20	9.86	0	01-07-2019	9,459.96	
21	26.53	0	01-08-2015	27,663.04	
22	13.22	0	01-09-2020	14,025.40	
23	11.18	0	01-01-2015	11,902.56	
24	16.01	0	01-10-2020	11,536.31	
25	2.4	0	01-10-2019	2,050.14	

Applied Steps: Changed data type of Total pymnt

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Bank Loan Performance Analysis



2. Round off the numbers in the 'funded_amnt' column to 2 decimal places.

Power Query Editor

fx = Table.TransformColumns(#"Replaced Value _ as",{{"purpose", Text.Proper, type text}})

Round

Specify how many decimal places to round to.

Decimal Places

2

OK Cancel

id	loan_amnt	1.2 funded_amnt	term	1.2 int_rate	1.2 installment
1	1077501	5000	4975 36 months		10.65
2	1077430	2500	2500 60 months		15.27
3	1077175	2400	2400 36 months		15.96
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15	1069057	10000	10000 36 months		10.65
16	1069759	1000	1000 36 months		16.29
17	1065775	10000	10000 36 months		15.27
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22	1039153	21000	21000 36 months		12.42
23	1069710	10000	10000 36 months		11.71
24	1069700	10000	10000 36 months		11.71
25	1069559	6000	6000 36 months		11.71

Query Settings

PROPERTIES

Name

LoanDetails

APPLIED STEPS

Source

Navigation

Promoted Headers

Changed Type

Removed Duplicates in ID

Replaced Value _ as

Capitalized Each Word in Pur...

PREVIEW DOWNLOADED AT 10:38

❖ Column Renaming:

1. Rename the column 'issue_d' to 'issue_date'.

Power Query Editor

fx = Table.RenameColumns(#"Rounded Off",{{"issue_d", "issue_date"}})

grade	sub_grade	issue_date	loan_status	purpose
162.87 B	B2	01-12-2018	Fully Paid	Credit Card
59.83 C	C4	01-12-2018	Charged Off	Car
84.33 C	C5	01-12-2018	Fully Paid	Small Business
339.31 C	C1	01-12-2018	Fully Paid	Other
67.79 B	B5	01-12-2018	Current	Other
156.46 A	A4	01-12-2018	Fully Paid	Wedding
170.08 C	C5	01-12-2018	Current	Debt Consolidation
109.43 E	E1	01-12-2018	Fully Paid	Car
152.39 F	F2	01-12-2018	Charged Off	Small Business
121.45 B	B5	01-12-2018	Charged Off	Other
153.45 C	C3	01-12-2018	Fully Paid	Debt Consolidation
402.54 B	B5	01-12-2018	Fully Paid	Debt Consolidation
305.38 C	C1	01-12-2018	Charged Off	Debt Consolidation
96.68 B	B1	01-12-2018	Fully Paid	Credit Card
325.74 B	B2	01-12-2018	Charged Off	Other
35.31 D	D1	01-12-2018	Fully Paid	Debt Consolidation
347.98 C	C4	01-12-2018	Fully Paid	Home Improvement
109.57 A	A1	01-12-2018	Fully Paid	Major Purchase
198.46 B	B3	01-12-2018	Fully Paid	Medical
280.01 A	A1	01-12-2018	Fully Paid	Debt Consolidation
484.63 C	C4	01-12-2018	Fully Paid	Debt Consolidation
701.73 B	B4	01-12-2018	Charged Off	Debt Consolidation
330.76 B	B3	01-12-2018	Fully Paid	Credit Card
330.76 B	B3	01-12-2018	Fully Paid	Debt Consolidation
198.46 B	B3	01-12-2018	Charged Off	Major Purchase

Query Settings

PROPERTIES

Name

LoanDetails

APPLIED STEPS

Source

Navigation

Promoted Headers

Changed Type

Removed Duplicates in ID

Replaced Value _ as

Capitalized Each Word in Pur...

Rounded Off

Renamed issue date

Renamed issue date

11 COLUMNS, 999+ ROWS

Column profiling based on top 1000 rows

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Bank Loan Performance Analysis



2. Rename the column 'last_pymnt_d' to 'last_pymnt_date'

FileHomeTransformAdd ColumnViewToolsHelp

Group By

Use First Row as Headers

Count Rows

Table

Transpose

Reverse Rows

Data Type: Date

Replace Values

Detect Data Type

Fill

Pivot Column

Rename

Unpivot Columns

Move

Convert to List

Split Column

Format

Text Column

Merge Columns

Extract

Parse

Statistics

Standard

Scientific

Number Column

Trigonometry

Rounding

Information

Date

Time

Duration

Date & Time Column

Run R script

Run Python script

Scripts

Queries [2]

fx

= Table.RenameColumns(#"Changed data type of Total pymnt",({{"last_pymnt_d", "last_pymnt_date"}}))

Query Settings

BorrowerDetails

LoanDetails

	A ⁸ verification_status	1.2 dti	1.2 delinq_2yrs	last_pymnt_date	\$ total_pymnt	
1	24000	Verified	27.65	0	01-01-2015	5,861.07
2	30000	Source Verified	1	0	01-04-2020	1,008.71
3	12252	Not Verified	8.72	0	01-06-2021	3,003.65
4	49200	Source Verified	20	0	01-01-2015	12,226.30
5	80000	Source Verified	17.94	0	01-01-2016	3,242.17
6	36000	Source Verified	11.2	0	01-01-2015	5,631.38
7	47004	Not Verified	23.51	0	01-01-2016	8,136.84
8	48000	Source Verified	5.35	0	01-01-2015	3,938.14
9	40000	Source Verified	5.55	0	01-04-2019	646.02
10	15000	Verified	18.08	0	01-11-2019	1,476.19
11	72000	Not Verified	16.12	0	01-06-2020	7,677.52
12	75000	Source Verified	10.78	0	01-09-2020	13,943.08
13	30000	Source Verified	10.08	0	01-07-2019	2,270.70
14	15000	Source Verified	12.56	0	01-01-2015	3,478.98
15	100000	Source Verified	7.06	0	01-10-2020	7,471.99
16	28000	Not Verified	20.31	0	01-01-2015	1,270.17
17	42000	Not Verified	18.6	0	01-01-2015	12,519.26
18	110000	Not Verified	10.52	0	01-05-2020	3,785.02
19	84000	Verified	18.44	2	01-02-2015	7,164.50
20	77385.19	Not Verified	9.86	0	01-07-2019	9,459.96
21	43370	Verified	26.53	0	01-08-2015	27,663.04
22	105000	Verified	13.22	0	01-09-2020	14,025.40
23	50000	Source Verified	11.18	0	01-01-2015	11,902.56
24	50000	Not Verified	16.01	0	01-10-2020	11,536.31
25	76000	Not Verified	2.4	0	01-10-2019	2,050.14

11 COLUMNS, 999+ ROWS Column profiling based on top 1000 rows

PROPERTIES

Name

BorrowerDetails

APPLIED STEPS

Source

Navigation

Promoted Headers

Changed Type

Replaced Value null to 0

Filtered Rows

Capitalized Each Word in Ho...

Changed data type of Total p...

Renamed last_pymnt_date

PREVIEW DOWNLOADED AT 10:38

❖ Creating New Columns:

1. Create a new custom column named 'total_amount_paid' to calculate the total amount paid by each borrower by subtracting 'out_prncp' from 'total_pymnt'.

10	18.08	0	11/1/2019	1,476.19
11	16.12	0	6/1/2020	7,677.52
12	10.78	0	9/1/2020	13,943.08
13	10.08	0	7/1/2019	2,270.70
14	12.56	0	1/1/2015	3,478.98
15	7.06	0	10/1/2020	7,471.99
16	20.31	0	1/1/2015	1,270.17
17	18.6	0	1/1/2015	12,519.26
18	10.52	0	5/1/2020	3,785.02
19	18.44	2	2/1/2015	7,164.50
20				

total_pymnt column changed ...

Bank Loan Performance Analysis



- Add a new conditional column named 'delinquency_status' to identify if the borrower has any delinquencies. If the number of delinquencies in 'delinq_2yrs' is greater than 0, the status should be "Delinquent", otherwise "Not Delinquent".

		last_pymnt_date	\$ total_pymnt	1.2 out_prncp	\$ Total_amount_paid	delinquency_status
1	0	01-01-2015	5,861.07	0	5,861.07	Not Delinquent
2	0	01-04-2020	1,008.71	0	1,008.71	Not Delinquent
3	0	01-06-2021	3,003.65	0	3,003.65	Not Delinquent
4	0	01-01-2015	12,226.30	0	12,226.30	Not Delinquent
5	0	01-01-2016	3,242.17	766.9	2,475.27	Not Delinquent
6	0	01-01-2015	5,631.38	0	5,631.38	Not Delinquent
7	0	01-01-2016	8,136.84	1889.15	6,247.69	Not Delinquent
8	0	01-01-2015	3,938.14	0	3,938.14	Not Delinquent
9	0	01-04-2019	646.02	0	646.02	Not Delinquent
10	0	01-11-2019	1,476.19	0	1,476.19	Not Delinquent
11	0	01-06-2020	7,677.52	0	7,677.52	Not Delinquent
12	0	01-09-2020	13,943.08	0	13,943.08	Not Delinquent
13	0	01-07-2019	2,270.70	0	2,270.70	Not Delinquent
14	0	01-01-2015	3,478.98	0	3,478.98	Not Delinquent
15	0	01-10-2020	7,471.99	0	7,471.99	Not Delinquent
16	0	01-01-2015	1,270.17	0	1,270.17	Not Delinquent
17	0	01-01-2015	12,519.26	0	12,519.26	Not Delinquent
18	0	01-05-2020	3,785.02	0	3,785.02	Not Delinquent
19	2	01-02-2015	7,164.50	0	7,164.50	Delinquent
20	0	01-07-2019	9,459.96	0	9,459.96	Not Delinquent
21	0	01-08-2015	27,663.04	0	27,663.04	Not Delinquent
22	0	01-09-2020	14,025.40	0	14,025.40	Not Delinquent
23	0	01-01-2015	11,902.56	0	11,902.56	Not Delinquent
24	0	01-10-2020	11,536.31	0	11,536.31	Not Delinquent
25	0	01-10-2019	2,050.14	0	2,050.14	Not Delinquent

❖ Column Dropping:

Remove the 'sub_grade' column as that does not significantly contribute to the analysis.

	1.2 int_rate	1.2 installment	A ^B grade	issue_date	A ^B loan_status	A ^B purpose
1	10.65	162.87	B	01-12-2018	Fully Paid	Credit Ca
2	15.27	59.83	C	01-12-2018	Charged Off	Car
3	15.96	84.33	C	01-12-2018	Fully Paid	Small Bu
4	13.49	339.31	C	01-12-2018	Fully Paid	Other
5	12.69	67.79	B	01-12-2018	Current	Other
6	7.9	156.46	A	01-12-2018	Fully Paid	Wedding
7	15.96	170.08	C	01-12-2018	Current	Debt Coi
8	18.64	109.43	E	01-12-2018	Fully Paid	Car
9	21.28	152.39	F	01-12-2018	Charged Off	Small Bu
10	12.69	121.45	B	01-12-2018	Charged Off	Other
11	14.65	153.45	C	01-12-2018	Fully Paid	Debt Coi
12	12.69	402.54	B	01-12-2018	Fully Paid	Debt Coi
13	13.49	305.38	C	01-12-2018	Charged Off	Debt Coi
14	9.91	96.68	B	01-12-2018	Fully Paid	Credit Ca
15	10.65	325.74	B	01-12-2018	Charged Off	Other
16	16.29	35.31	D	01-12-2018	Fully Paid	Debt Coi
17	15.27	347.98	C	01-12-2018	Fully Paid	Home In
18	6.03	109.57	A	01-12-2018	Fully Paid	Major Pt
19	11.71	198.46	B	01-12-2018	Fully Paid	Medical
20	6.03	280.01	A	01-12-2018	Fully Paid	Debt Coi
21	15.27	484.63	C	01-12-2018	Fully Paid	Debt Coi
22	12.42	701.73	B	01-12-2018	Charged Off	Debt Coi
23	11.71	330.76	B	01-12-2018	Fully Paid	Credit Ca
24	11.71	330.76	B	01-12-2018	Fully Paid	Debt Coi
25	11.71	198.46	B	01-12-2018	Charged Off	Major Pt

Bank Loan Performance Analysis



3. Data Modeling

- ❖ Identify the common column between both the tables and establish relationships between the two tables. Ensure the cross-filter direction is set to "Both". This step is crucial for enabling cross-table analysis and ensuring data integrity within the dataset.

New relationship

Select tables and columns that are related.

From table

BorrowerDetails

owners...	last_pymnt_d...	loan_id	member_id	out_prncp	total_amount...	verification_st...
ge	01 November...	1064932	1298984	0	23996.94	Verified
ge	01 June 2021	1063509	1296075	0	22756.2027	Verified
ge	01 February 2...	1033569	1263136	0	20596.97	Verified

To table

LoanDetails

funded_amnt	grade	id	installment	int_rate	issue_date	loan_amnt
10000	B	33341471	334.49	12.49	01 October 2...	10000
10000	B	33370884	334.49	12.49	01 October 2...	10000
10000	B	33161072	334.49	12.49	01 October 2...	10000

Cardinality

Many to one (*:1)

☒ Make this relationship active

☐ Assume referential integrity

Cross-filter direction

Both

☐ Apply security filter in both directions

Save **Cancel**

Bank Loan Performance Analysis



4. Creating Measures and Calculated Columns using DAX

- ❖ Create a new calculated column named 'remaining_installments' using DAX in the "Borrower Details" table to calculate the number of remaining installments by dividing the remaining principal amount ('out_prncp') by the monthly installment amount ('installment') and round up the result using the CEILING() function to account for any partial payments.

1 remaining_installments = CEILING(DIVIDE(BorrowerDetails[out_prncp],BorrowerDetails[dti]),1)

inc	verification_status	dti	delinq_2yrs	last_pymnt_date	total_pymnt	out_prncp	total_amount_paid	delinquency_status	remaining_installments
82300	Verified	0.01	0	01 December 2015	₹ 11,121.26	28728.31	-17607.05	Not Delinquent	2872831
170000	Source Verified	0.07	0	01 January 2016	₹ 12,173.12	27450.37	-15277.25	Not Delinquent	392149
90000	Source Verified	0.07	0	01 January 2016	₹ 31,258.4	16579.14	-14679.26	Not Delinquent	236845
280000	Verified	0.11	0	01 December 2015	₹ 12,979.57	19085.86	-6106.29	Not Delinquent	173508
400000	Verified	0.08	0	01 January 2016	₹ 11,784.57	11660.19	124.38	Not Delinquent	145753
55403	Verified	0.11	0	01 January 2016	₹ 9,430.59	13948	-4517.41	Not Delinquent	126800
380000	Not Verified	0.12	0	01 January 2016	₹ 11,900.55	15003.84	-3103.29	Not Delinquent	125032
118700	Source Verified	0.25	0	01 December 2015	₹ 14,652.54	26917.66	-12265.12	Not Delinquent	107671
870000	Source Verified	0.21	0	01 January 2016	₹ 12,697.13	20792.42	-8095.29	Not Delinquent	99012
102000	Verified	0.29	0	01 January 2016	₹ 20,150.22	24225.24	-4075.02	Not Delinquent	83536
42000	Source Verified	0.03	0	01 January 2016	₹ 1,748.34	2223.95	-475.61	Not Delinquent	74132
99995	Source Verified	0.07	0	01 January 2016	₹ 24,980.4	5154.69	19825.71	Not Delinquent	73639
150000	Verified	0.38	1	01 August 2015	₹ 11,185.95	27847.66	-16661.71	Delinquent	73284
75000	Verified	0.4	1	01 January 2016	₹ 10,835.22	29136.85	-18301.63	Delinquent	73284
480000	Source Verified	0.13	0	01 January 2016	₹ 7,437.9	9377.34	-1939.44	Not Delinquent	71990
400000	Source Verified	0.11	0	01 January 2016	₹ 6,821.68	7918.87	-1097.19	Not Delinquent	69423
110000	Verified	0.27	0	01 January 2016	₹ 8,186.6	18744.04	-10557.44	Not Delinquent	63795
300000	Verified	0.19	0	01 January 2016	₹ 16,402.32	12121.01	4281.31	Not Delinquent	63230
66560	Verified	0.16	0	01 January 2016	₹ 8,220.2	10116.71	-1896.51	Not Delinquent	61127
217000	Verified	0.32	0	01 January 2016	₹ 28,444.5	19560.64	8883.86	Not Delinquent	60108
240000	Verified	0.25	0	01 January 2016	₹ 17,780.39	15026.95	2753.44	Not Delinquent	59999
1560077	Source Verified	0.25	0	01 January 2016	₹ 6,444.24	14999.56	-6355.32	Not Delinquent	58568
50122.8	Verified	0.36	0	01 January 2016	₹ 9,070.65	21084.35	-12013.7	Not Delinquent	57811
46282	Verified	0.26	0	01 January 2016	₹ 11,815.32	15030.82	-3215.5	Not Delinquent	

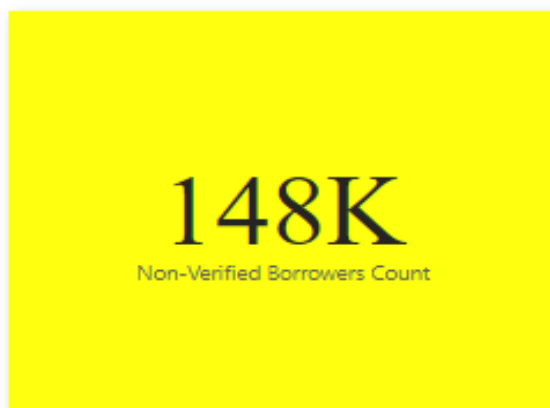
DAX FORMULA USED:

```
remaining_installments = CEILING(DIVIDE(BorrowerDetails[out_prncp],BorrowerDetails[dti]),1)
```

In short, the DAX code calculates the number of installments remaining for each borrower by factoring in their current loan amount, monthly payments, and any additional payments.

- ❖ Create a measure named '**Non-Verified Borrowers Count**' using DAX to count the number of loans that have been 'Not Verified'.

```
1 Non-Verified Borrowers Count = CALCULATE(COUNT(BorrowerDetails[verification_status]),BorrowerDetails[verification_status] = "Not verified")
```



When applied to your data, this measure will count the loans marked as "Not Verified." The result is 148,000, indicating that 148,000 loans are still unverified.

Bank Loan Performance Analysis



- ❖ Create a measure named 'Fully Paid Loan Percentage' to calculate the percentage of fully paid loans. Divide the number of loans with a "Fully Paid" loan status by the total number of loans and then format this measure as Percentage.

Power BI Desktop interface showing the 'Fully Paid Loan Percentage' measure and the 'LoanDetails' table.

Measure tools:

- Name: Fully Paid Loan Per...
- Format: General
- Data category: Uncategorized

Measure: 1 Fully Paid Loan Percentage = $\text{CALCULATE}(\text{COUNT}(\text{LoanDetails}[\text{loan_status}]), \text{LoanDetails}[\text{loan_status}] = \text{"Fully Paid"}) / \text{COUNT}(\text{LoanDetails}[\text{loan_status}]) * 100$

Table: LoanDetails (466,179 rows)

id	loan_amnt	funded_amnt	term	int_rate	installment	grade	issue_date	loan_status	purpose
4324946	10000	10000	36 months	10.16	323.43	B	01 April 2020	Fully Paid	Debt Consolidation
4276540	10000	10000	36 months	10.16	323.43	B	01 April 2020	Fully Paid	Debt Consolidation
4244710	10000	10000	36 months	10.16	323.43	B	01 April 2020	Fully Paid	Debt Consolidation
4166591	10000	10000	36 months	10.16	323.43	B	01 April 2020	Fully Paid	Debt Consolidation
4174653	10000	10000	36 months	10.16	323.43	B	01 April 2020	Fully Paid	Debt Consolidation
3921356	10000	10000	36 months	10.16	323.43	B	01 April 2020	Fully Paid	Debt Consolidation
3915434	10000	10000	36 months	10.16	323.43	B	01 April 2020	Fully Paid	Debt Consolidation
3810514	10000	10000	36 months	10.16	323.43	B	01 April 2020	Fully Paid	Debt Consolidation
3666457	10000	10000	36 months	10.16	323.43	B	01 March 2020	Fully Paid	Debt Consolidation
3641654	10000	10000	36 months	10.16	323.43	B	01 March 2020	Fully Paid	Debt Consolidation
3629985	10000	10000	36 months	10.16	323.43	B	01 March 2020	Fully Paid	Debt Consolidation
3627392	10000	10000	36 months	10.16	323.43	B	01 March 2020	Fully Paid	Debt Consolidation
3636529	10000	10000	36 months	10.16	323.43	B	01 March 2020	Fully Paid	Debt Consolidation
3625610	10000	10000	36 months	10.16	323.43	B	01 March 2020	Fully Paid	Debt Consolidation
3634811	10000	10000	36 months	10.16	323.43	B	01 March 2020	Fully Paid	Debt Consolidation
3605490	10000	10000	36 months	10.16	323.43	B	01 March 2020	Fully Paid	Debt Consolidation
3535134	10000	10000	36 months	10.16	323.43	B	01 March 2020	Fully Paid	Debt Consolidation
3485831	10000	10000	36 months	10.16	323.43	B	01 February 2020	Fully Paid	Debt Consolidation
3383788	10000	10000	36 months	10.16	323.43	B	01 February 2020	Fully Paid	Debt Consolidation
3355635	10000	10000	36 months	10.16	323.43	B	01 February 2020	Fully Paid	Debt Consolidation
3366343	10000	10000	36 months	10.16	323.43	B	01 February 2020	Fully Paid	Debt Consolidation
3364734	10000	10000	36 months	10.16	323.43	B	01 February 2020	Fully Paid	Debt Consolidation
3355835	10000	10000	36 months	10.16	323.43	B	01 February 2020	Fully Paid	Debt Consolidation
3344823	10000	10000	36 months	10.16	323.43	B	01 February 2020	Fully Paid	Debt Consolidation
3300601	10000	10000	36 months	10.16	323.43	B	01 February 2020	Fully Paid	Debt Consolidation

DAX FORMULA USED:

```
1 Fully Paid Loan Percentage = CALCULATE(COUNT(LoanDetails[loan_status]), LoanDetails[loan_status] = "Fully Paid") / COUNT(LoanDetails[loan_status]) * 100
```

39.62
Fully Paid Loan
Percentage

The 'Fully Paid Loan Percentage' measure indicates the percentage of your loans that have been paid in full. It's calculated by comparing the number of fully paid loans to the total number of loans. According to the measure, 39.62% of your loans have been fully repaid.

Bank Loan Performance Analysis



5. Creating Comprehensive Reports:

✓ Report 1: Loan Performance Analysis

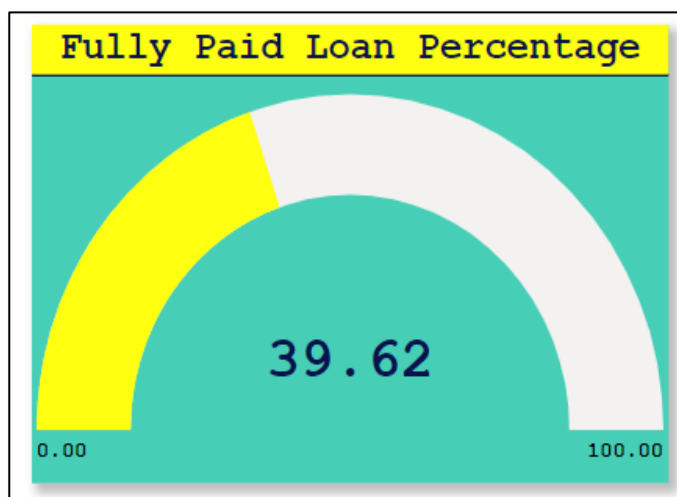
The Loan Performance Analysis report evaluates loan performance based on factors like amount, status, term, interest rate, and purpose.

- ❖ **Total Funded Amount:** Create a card visual to display the total funded amount.



The visual representation shows a total funded amount of \$6,630.186.

- ❖ **Fully Paid Loan Percentage:** Create a gauge chart to display the 'Fully Paid Loan Percentage' measure.

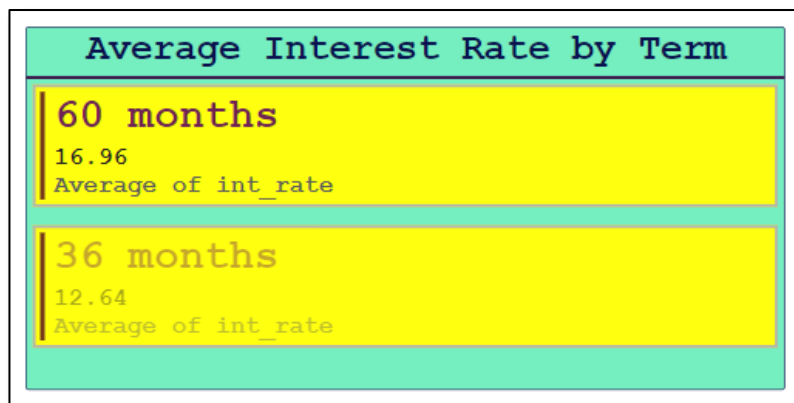


The gauge chart indicates that 39.62% of loans have been fully repaid.

Bank Loan Performance Analysis

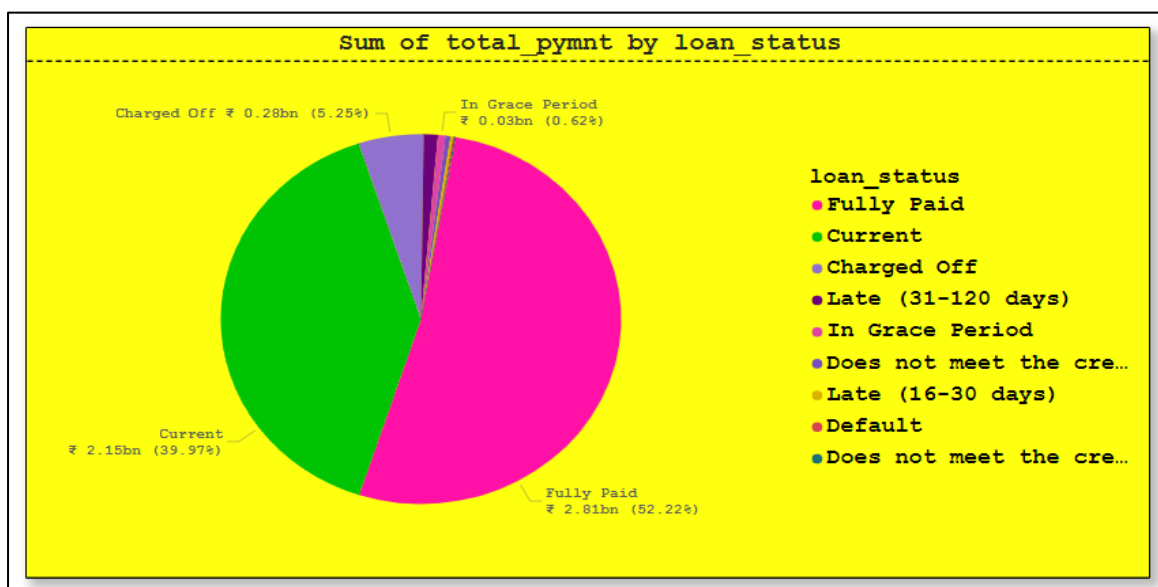


- ❖ **Average Interest Rate by Term:** Create a multi-row card to show the average interest rate for each term.



Loans with 36-month terms had an average interest rate of 12.64%, while those with 60-month terms had an average interest rate of 16.96%.

- ❖ **Loan Status Distribution:** Create a pie chart to visualize the sum of total payments by loan status.

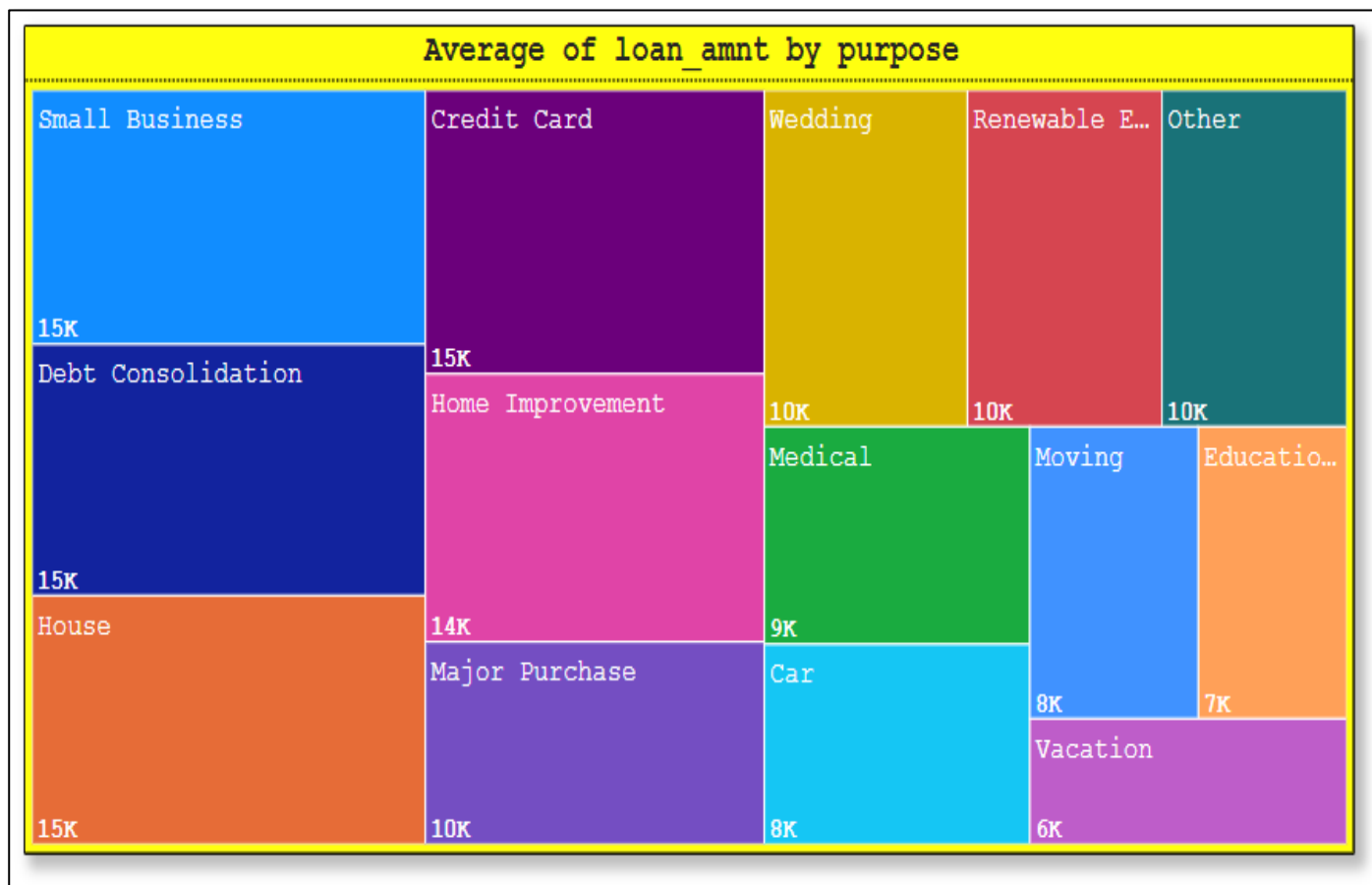


The pie chart titled "Sum of total pymnt by loan_status" visualizes the distribution of total payments for various loan statuses. It shows that a significant portion of loans are either fully paid (52.22%) or currently being repaid (39.97%). Smaller categories like "Charged Off" (5.25%) and "Late" (1.56%) indicate potential risks in the loan portfolio.

Bank Loan Performance Analysis



- ❖ **Loan Amount by Purpose:** Create a tree map to show the average loan amount by purpose.

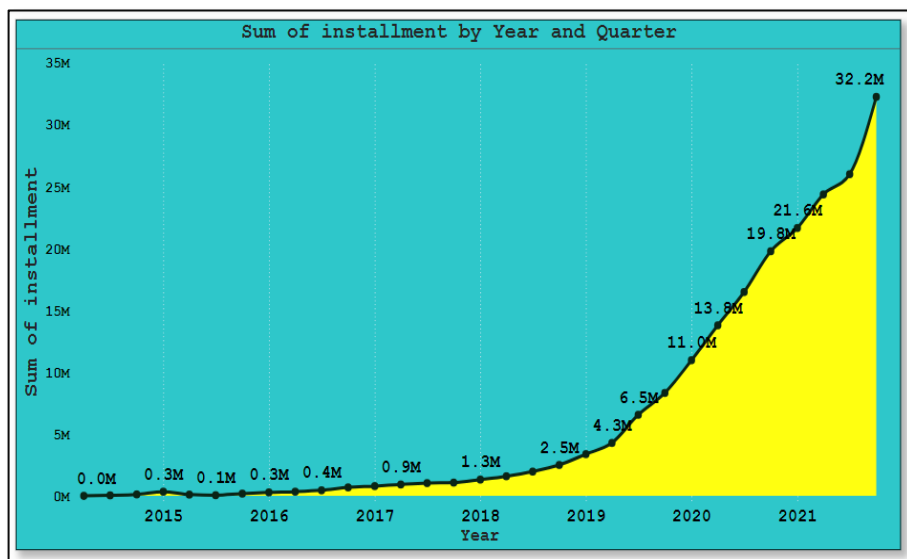


- Overall, the tree map provides a visual representation of the distribution of average loan amounts across different loan purposes. This can be helpful for understanding the types of loans that are typically larger or smaller in size.
- The tree map "Average of loan_amnt by purpose" shows the average loan amounts for different purposes. The largest loan amounts are for "Small Business" (15K), "House" (15K), and "Debt Consolidation" (15K). Smaller loan amounts are for "Vacation" (6K), "Car" (8K), and "Medical" (9K). Other categories like "Wedding" and "Renewable Energy" have average loan amounts around 10K.

Bank Loan Performance Analysis



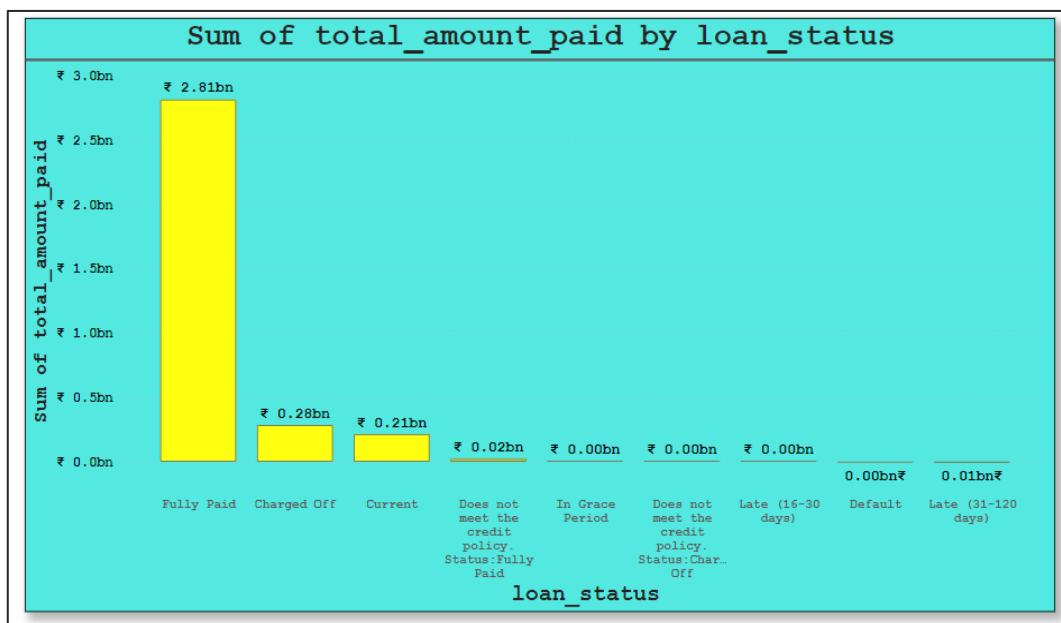
- ❖ **Installment Over Time:** Create a line chart to visualize the sum of installments by Year and Quarter of the issue date.



"It shows a clear upward trend, with a significant acceleration in growth from 2019 onwards. The highest total installments were recorded in the final quarter of 2021, reaching 32.2 million. The chart indicates a positive financial performance for the company or organization represented, likely driven by increased market demand, effective marketing strategies, or product launches."

The line chart illustrates the total amount of installments paid over time, divided into yearly and quarterly intervals.

- ❖ **Maximum Total Amount Paid by Loan Status:** Create a column chart to display the maximum total amount paid by loan status.



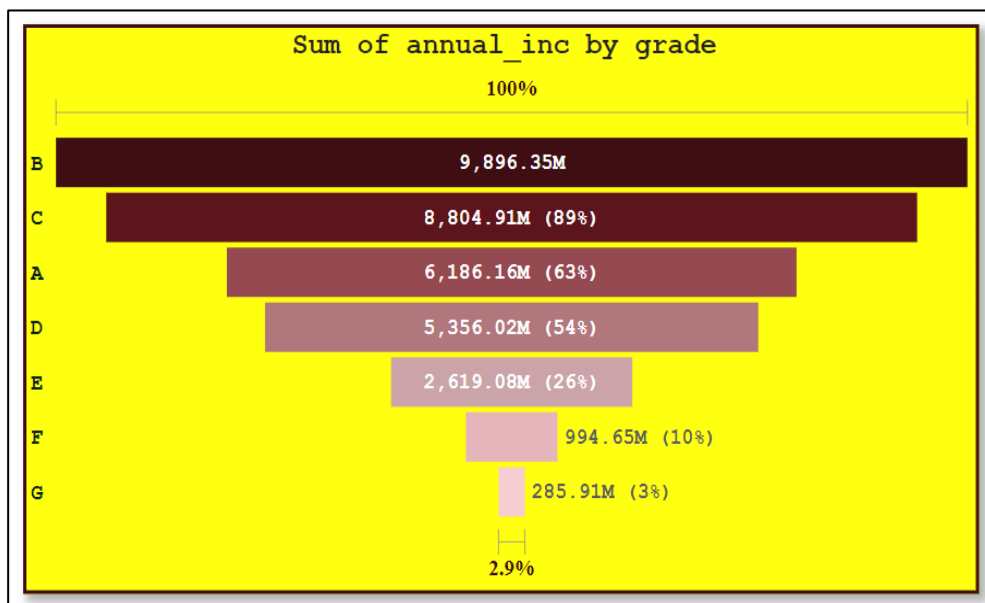
The majority of the payments, totaling 2.81 billion rupees, were made for fully paid loans. A significantly smaller amount, 0.28 billion rupees, was paid for charged-off loans. The remaining loan statuses, such as current, in grace period, and late payments, have relatively negligible payment amounts. This suggests that most borrowers are able to repay their loans in full, while a smaller portion default on their payments.

The bar chart illustrates the total amount of money paid for loans based on their status.

Bank Loan Performance Analysis



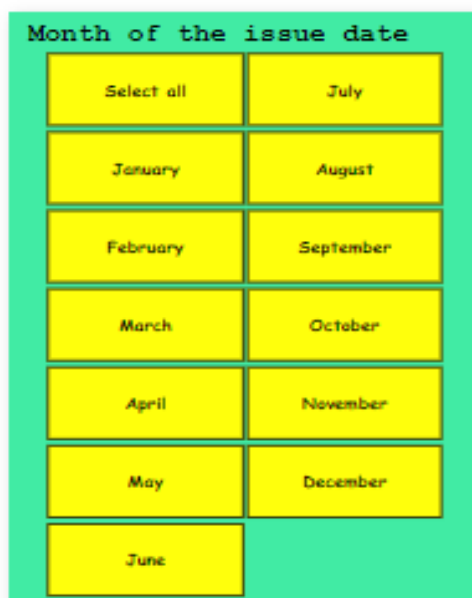
- ❖ **Minimum Annual Income by Grade:** Create a funnel chart to show the minimum annual income by grade.



The highest earning grade is B, followed by C, A, and so on. The chart also shows the percentage contribution of each grade to the total income. For example, grade B contributes 89% of the total income, while grade G contributes only 3%. This indicates that the higher grades generally earn more than the lower grades, with a significant disparity between the top and bottom grades.

The bar chart illustrates the sum of annual income by grade, representing the total earnings for each grade level.

- ❖ **Issue Date Slicer:** Add a slicer for the Month of the issue date to enable dynamic data exploration.



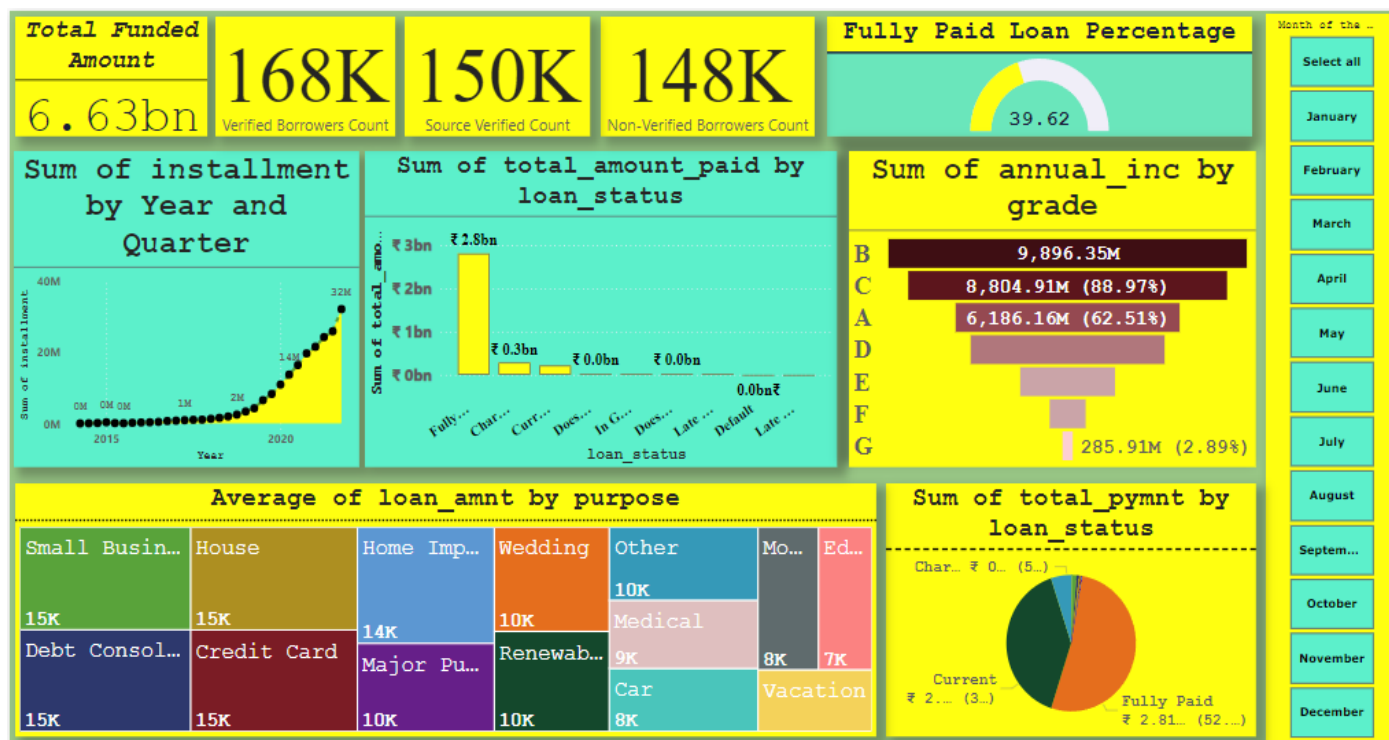
By clicking on individual months, users can focus on data from particular time periods. This functionality is useful for identifying trends, patterns, or anomalies that occur within specific months of the year.

The slicer is a filtering tool that enables users to select specific months to include or exclude in their analysis

Bank Loan Performance Analysis



Consolidated Report 1: Loan Performance Analysis



Analysis of the Financial Dashboard

Key Observations:

❖ Loan Funding and Performance:

- The total funded amount is ₹6.63 billion, with a significant portion (₹8.8 billion) fully paid.
- The fully paid loan percentage is 88.97%, indicating strong loan performance.
- The sum of installments by year and quarter shows a consistent trend of growth, suggesting increasing lending activity.

❖ Borrower Verification:

- There are 168K verified borrowers, 150K source-verified borrowers, and 148K non-verified borrowers. This information can be used to assess the risk profile of the borrower base.

❖ Loan Purpose and Amount:

- The average loan amount for small business loans is higher than for other purposes, suggesting that these loans are typically larger.
- Home improvement and house purchases also have significant average loan amounts.

❖ Loan Status:

- The sum of total payments by loan status shows that a large portion of loans are current, with fewer late, defaulted, or written-off loans.

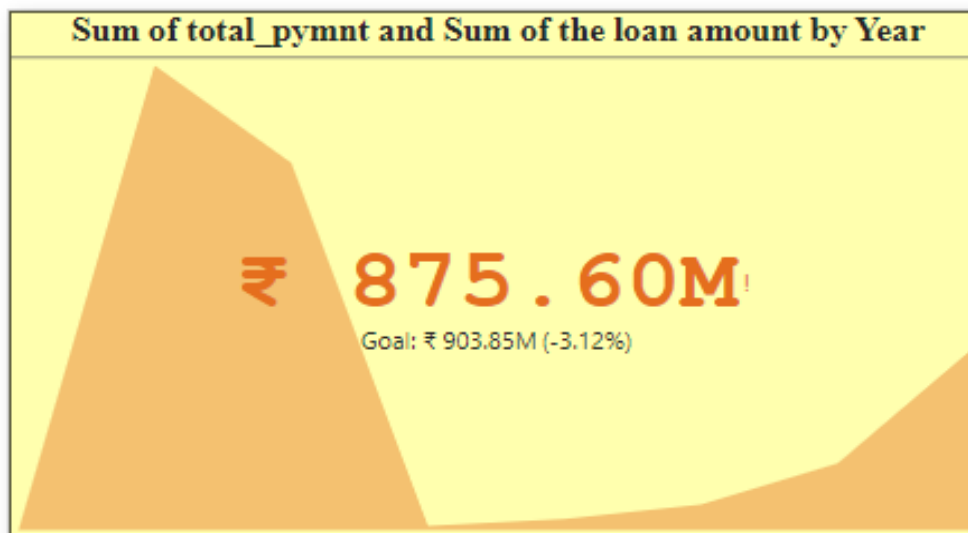
Bank Loan Performance Analysis



✓ Report 2: Borrower Profile Analysis

The Borrower Profile Analysis report aims to provide insights into the characteristics of borrowers such as home ownership, annual income, employment length, verification status, debt-to-income ratio, and delinquency history.

- ❖ **KPI Visual:** Create a KPI visual with the sum of total payment as the value, the year of last payment date as the trend axis, and the sum of loan amount as the target. Round off to 2 decimal points and format as \$ currency.



Key points from the graph:

- Trend: The graph displays a trend where the sum of total payments and the sum of loan amounts initially increased rapidly, reaching a peak, and then declined significantly before starting to increase again.
- Goal: The graph also indicates a goal of ₹903.85M. The current value of ₹875.60M is below the goal by -3.12%.
- Units: The values are measured in Indian Rupees (₹).

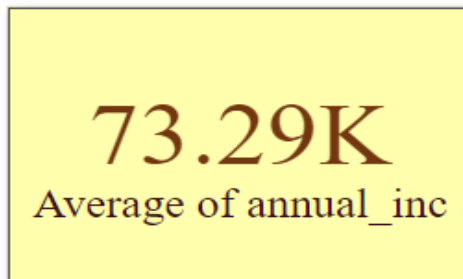
Possible interpretations:

- Financial performance: The graph might represent the financial performance of a lending institution over a period of years. The initial increase could indicate strong growth in lending activity and loan repayments. The subsequent decline might suggest a period of economic downturn or challenges in loan collections. The renewed increase could signify a recovery in the lending business.
- Project progress: Alternatively, the graph could represent the progress of a project or initiative. The initial increase might reflect early success, followed by a period of setbacks or challenges. The renewed increase could indicate a resurgence of momentum towards achieving the goal.

Bank Loan Performance Analysis



- ❖ **Average of Annual Income:** Display the average of annual income using a card visual.



- ❖ *73.29K: This Represents the Average Annual Income, Likely Measured in Thousands of Units (E.G., Dollars, Rupees, Etc.).*
- ❖ *Annual_Inc: This Indicates That the Data Is Related to The Annual Income of The Individuals.*

The image shows the average annual income of a group of individuals

- ❖ **Non-Verified Borrowers Count:** Display the count of non-verified borrowers using a card visual.

- *148K: This represents the count of borrowers who have not been verified.*
- *Non-Verified Borrowers Count: This indicates that the number refers to borrowers whose identity or creditworthiness has not been confirmed through verification processes.*



The image shows the number of non-verified borrowers.

Bank Loan Performance Analysis



- ❖ **Average Debt-to-Income by Delinquency Status:** Create a multi-row card to show the average debt-to-income ratio by delinquency status.

Average Debt-to-Income by Delinquency Status	
Delinquent	17.16
Average of dti	
Not Delinquent	17.23
Average of dti	

The image shows the average debt-to-income (DTI) ratio for two groups of individuals: those who are delinquent on their loans and those who are not.

Key points from the image:

- Delinquent borrowers: The average DTI for delinquent borrowers is 17.16. This means that, on average, delinquent borrowers have a debt load that is 17.16% of their annual income.
- Non-delinquent borrowers: The average DTI for non-delinquent borrowers is 17.23. This means that, on average, non-delinquent borrowers have a debt load that is 17.23% of their annual income.

Comparison:

- Slightly higher DTI for non-delinquent borrowers: Interestingly, the average DTI is slightly higher for non-delinquent borrowers compared to delinquent borrowers. This might suggest that factors other than DTI, such as credit history, income stability, or other financial factors, also play a role in determining whether a borrower becomes delinquent.

Bank Loan Performance Analysis



- ❖ **Sum of Loan Amount by Home Ownership:** Create a table to show the total loan amount by home ownership.

home_ownership	Sum of loan_amnt
Mortgage	3769746525
Rent	2335977185
Own	562627610
Other	1967450
None	648775
Any	5000
Total	6674456000

- ❖ It shows that individuals with mortgages have received the largest amount of loans, followed by renters. The remaining categories, including homeowners, those who live in other arrangements, and those who have no home ownership, have received relatively smaller amounts of loans.
- ❖ Overall, the data suggests that individuals with stable housing arrangements, such as mortgages or rent, are more likely to obtain loans compared to those with less secure housing situations.

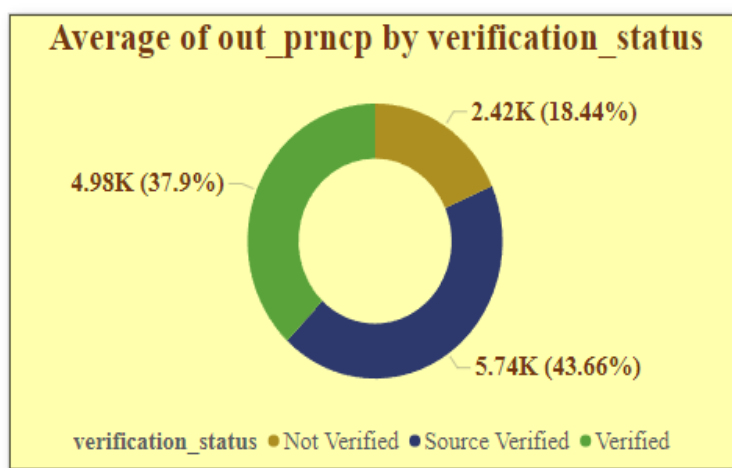
The table provides a breakdown of the total loan amounts based on different home ownership statuses.

- ❖ **Average Remaining Principal by Verification Status:** Create a donut chart to display the average remaining outstanding principal by verification status.

The chart shows the average amount of the principal outstanding (out_prncp) for borrowers based on their verification status.

It reveals that verified borrowers have the highest average out_prncp, followed by source verified borrowers. Not verified borrowers have the lowest average out_prncp.

These findings suggest that borrowers who have undergone more rigorous verification processes are more likely to have larger outstanding loan amounts, possibly indicating higher creditworthiness or a greater capacity to manage larger loans.



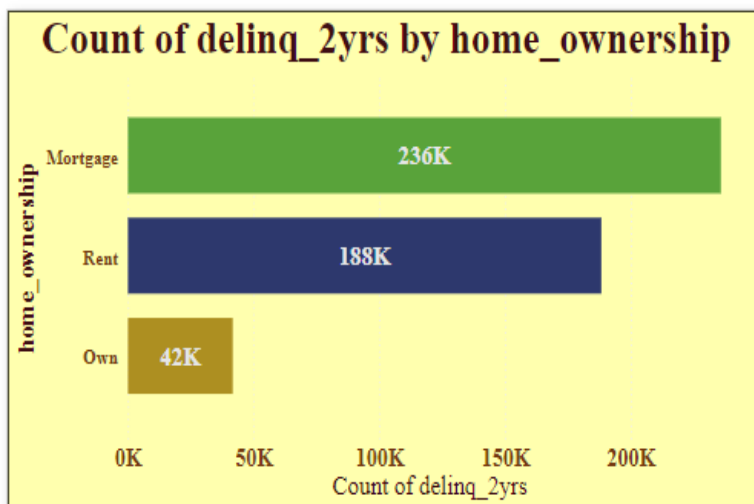
The image shows the average amount of the principal outstanding (out_prncp) for borrowers based on their verification status.

Bank Loan Performance Analysis



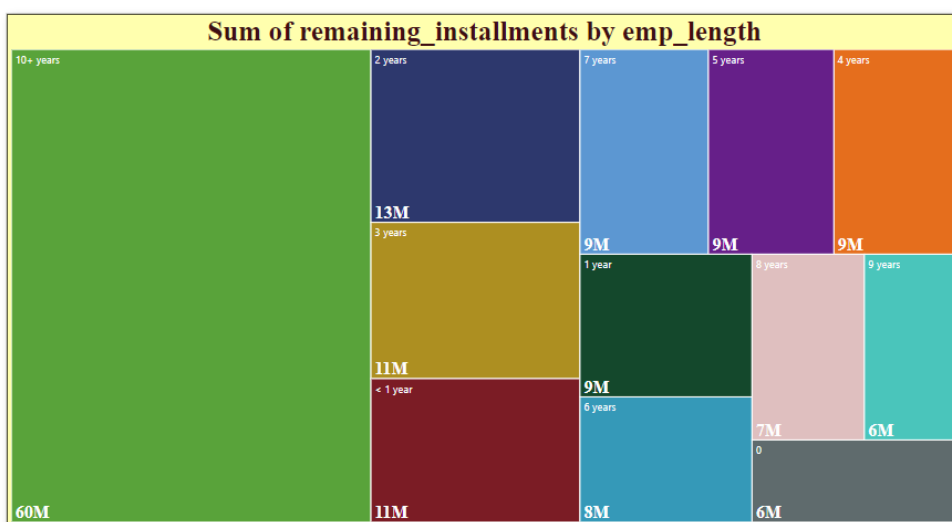
- ❖ **Sum of Delinquencies by Home Ownership:** Create a bar chart to show the total number of delinquencies in the past 2 years by home ownership and filter the visual to display only Mortgage, Rent, and Own.

It reveals that individuals with mortgages have the highest count of delinquencies, followed by renters. Homeowners have a significantly lower count of delinquencies. This suggests that borrowers with stable housing arrangements, such as mortgages or rent, may be more likely to experience financial difficulties and default on their loans compared to those with less secure housing situations.



The chart shows the number of borrowers who have had delinquencies in the past two years (delinq_2yrs) categorized by their home ownership status.

- ❖ **Max Remaining Installments by Employment Length:** Create a tree map to show the maximum remaining installments by employment length.



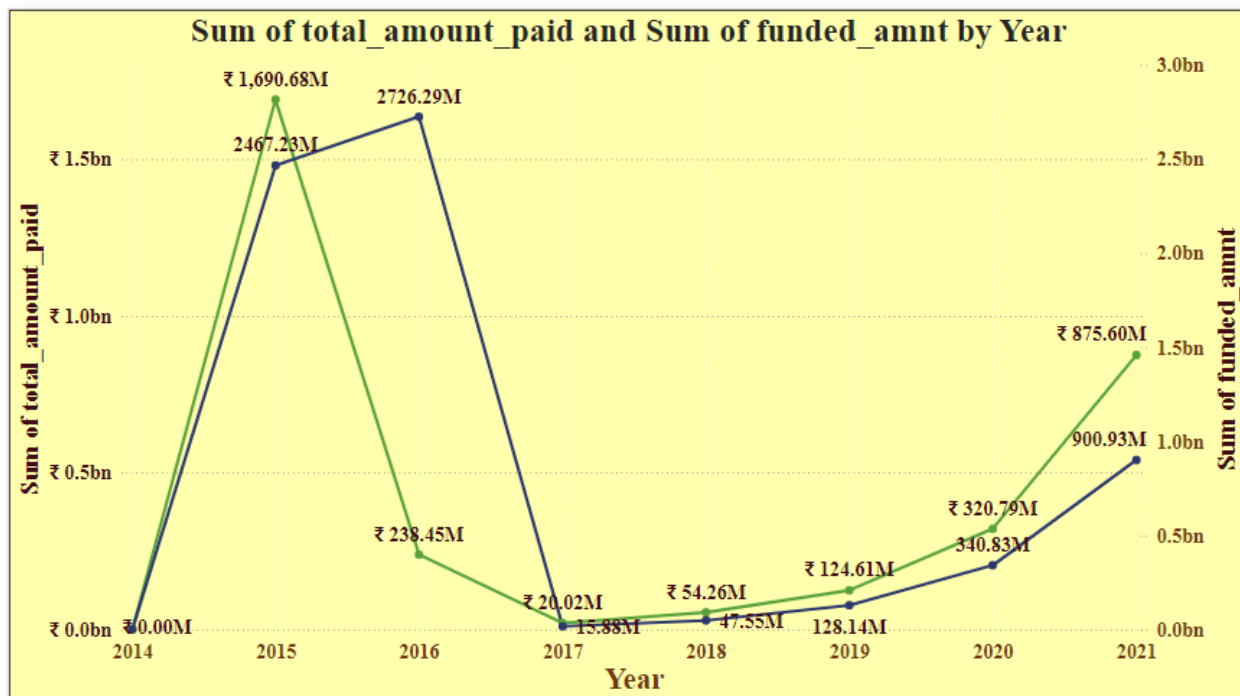
The largest rectangle, representing 10+ years of employment length, has the highest sum of remaining installments, indicating that borrowers with longer employment tenures tend to have larger outstanding loan balances. As the employment length decreases, the size of the rectangles generally becomes smaller, suggesting that borrowers with shorter employment tenures tend to have lower outstanding loan balances.

The image shows a tree map representing the sum of remaining installments for borrowers categorized by their employment length (emp_length).

Bank Loan Performance Analysis



- ❖ **Total Amount Paid and Funded Amount Over Time:** Create a line chart to display the sum of total amount paid and the sum of funded amount by the year of last payment date.



The image shows a line graph comparing the sum of total amount paid and the sum of funded amount over the years 2014 to 2021.

Key observations:

- **Sum of total amount paid:** This line represents the total amount of money that has been paid back to the lender by borrowers over time. It generally shows an upward trend, indicating that borrowers are making regular payments on their loans.
- **Sum of funded amount:** This line represents the total amount of money that has been loaned out to borrowers by the lender over time. It also shows an upward trend, indicating that the lender is continuously providing new loans.
- **Comparison:** While both lines show an upward trend, the sum of funded amount generally exceeds the sum of total amount paid, suggesting that the lender is disbursing new loans at a faster rate than borrowers are repaying existing loans.
- **Year-over-year fluctuations:** Both lines exhibit fluctuations from year to year, indicating that there are variations in lending activity and repayment rates. For example, there was a significant increase in both sums in 2015, followed by a decline in 2016.

Bank Loan Performance Analysis



- ❖ **Purpose Slicer:** Add a slicer for loan purpose to enable dynamic data exploration

Purpose	
Select all	Medical
Car	Moving
Credit Card	Other
Debt Consolidation	Renewable Energy
Educational	Small Business
Home Improvement	Vacation
House	Wedding
Major Purchase	

The image appears to be a slicer, which is a tool used in data analysis and visualization to filter data based on specific criteria.

Here's how the slicer works:

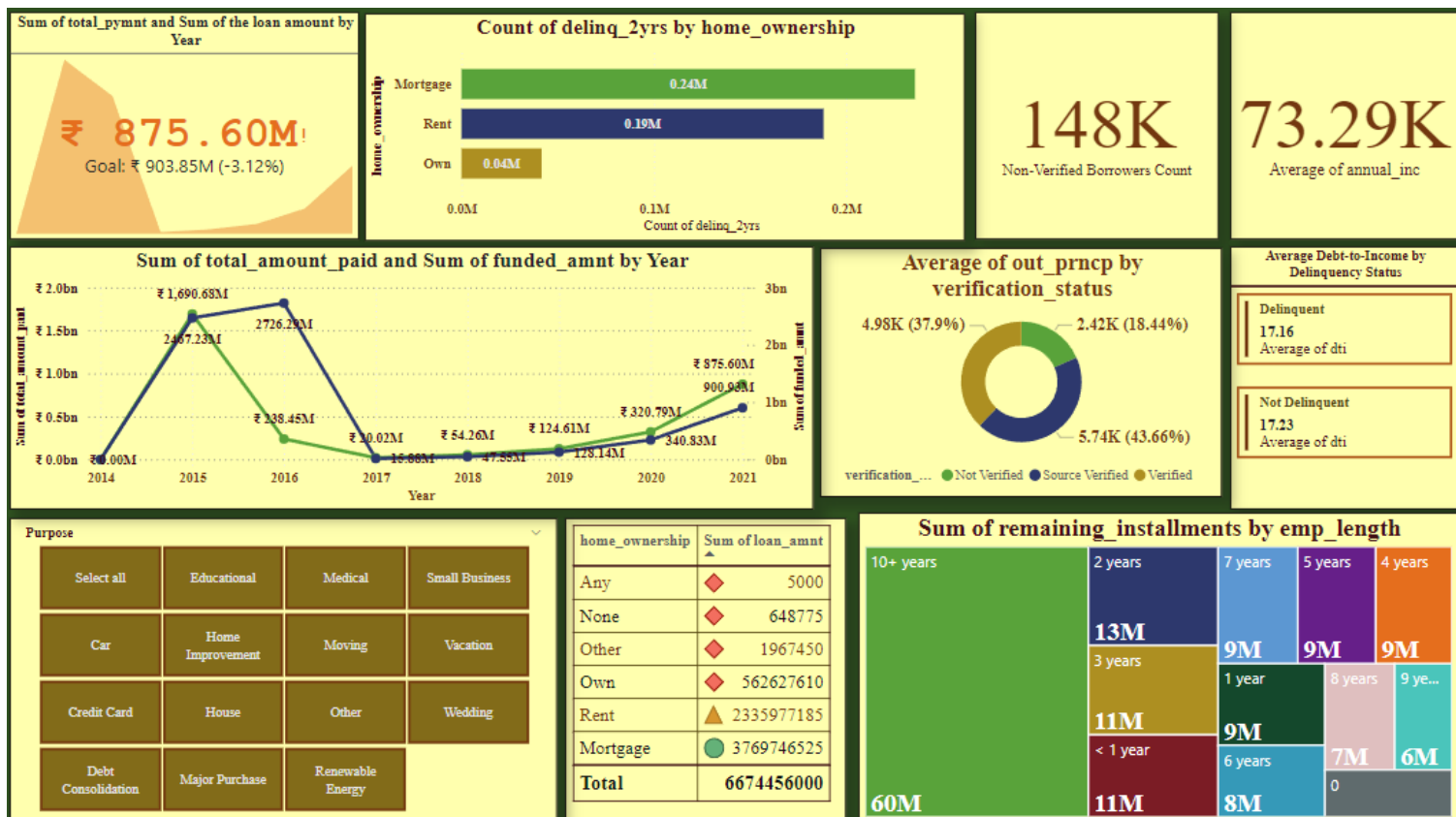
1. **Select all:** This option allows users to select all loan purposes, effectively showing all data without any filtering.
2. **Individual purposes:** Users can click on any of the other options (e.g., Medical, Car, Credit Card) to select that specific loan purpose. When a purpose is selected, the data displayed will be filtered to only include records related to that purpose.
3. **Multiple selections:** Users can select multiple purposes by clicking on them individually. This will filter the data to include records related to all selected purposes.

By using this slicer, users can quickly and easily analyze data based on different loan purposes, gaining insights into the distribution of loans, borrower preferences, and other relevant metrics.

Bank Loan Performance Analysis



Consolidated Report 2: Borrower Profile Analysis



Bank Loan Performance Analysis

Analysis of the Borrower Profile Dashboard



Key Observations:

❖ Loan Performance:

- The overall loan amount is ₹875.60 million, with a goal of ₹903.85 million.
- The delinquency rate for the past 2 years is relatively low, indicating good loan performance.
- The average debt-to-income ratio for both delinquent and non-delinquent borrowers is similar, suggesting that income levels may not be a significant factor in delinquency.

❖ Borrower Characteristics:

- A significant portion of borrowers (148K) have not verified their information, which could pose risks.
- The average annual income of borrowers is ₹73,290, which may provide insights into the target market.

❖ Loan Purpose:

- Home improvement, credit card debt consolidation, and house purchases are the most popular loan purposes, suggesting that these areas have significant demand.

❖ Loan Funding:

- The total amount funded has increased over the years, indicating growth in lending activities.

Potential Insights and Recommendations:

- **Target Market:** The data suggests that borrowers primarily seek loans for home improvement, debt consolidation, and house purchases. Targeting individuals or businesses in these sectors could be effective.
- **Risk Assessment:** While the delinquency rate is low, the number of non-verified borrowers could pose risks. Implementing more stringent verification processes could help mitigate these risks.
- **Income Analysis:** Although the debt-to-income ratio is similar for delinquent and non-delinquent borrowers, further analysis could reveal other factors influencing delinquency, such as credit history or loan-to-value ratios.
- **Loan Product Development:** Based on the popular loan purposes, considering developing specialized loan products tailored to these needs could attract more customers.



Bank Loan Performance Analysis



Detailed Analysis of the Overall Dashboard

Overview

This dashboard provides a comprehensive overview of a financial dataset, offering insights into loan performance, borrower characteristics, loan purpose, and funding trends. Key metrics include total funded amount, loan status, borrower verification, loan purpose, and delinquency rates.

Key Findings

Loan Performance:

- **Strong Performance:** The high percentage of fully paid loans (88.97%) indicates strong overall loan performance.
- **Consistent Growth:** The sum of installments by year and quarter shows a steady increase in lending activity.
- **Delinquency:** The delinquency rate for the past 2 years is low, suggesting effective risk management.

Borrower Characteristics:

- **Verification Status:** A significant portion of borrowers (148K) have not verified their information, which could pose risks.
- **Average Income:** The average annual income of borrowers is ₹73,290, providing insights into the target market.

Loan Purpose:

- **Popular Purposes:** Small business loans, home improvement, and house purchases are the most common loan purposes.
- **Loan Amounts:** Small business loans have the highest average loan amount, indicating larger transactions.

Loan Funding:

- **Total Funded Amount:** The total funded amount is ₹6.63 billion, with a significant portion (₹8.8 billion) fully paid.
- **Funding Trends:** The sum of funded amount by year and quarter shows a consistent trend of growth, suggesting increasing lending activity.



Bank Loan Performance Analysis



Insights and Recommendations

- **Risk Management:** While the delinquency rate is low, the number of non-verified borrowers could pose risks. Implementing more stringent verification processes could help mitigate these risks.
- **Product Focus:** The data suggests that small business, home improvement, and house purchase loans are popular. The organization could focus on developing and marketing products tailored to these segments.
- **Customer Segmentation:** Analyzing borrower characteristics (e.g., income, credit score, loan purpose) can help identify different customer segments and tailor marketing and product offerings accordingly.
- **Performance Tracking:** Regularly monitoring key performance indicators (KPIs) such as loan delinquency rates, loan-to-value ratios, and customer satisfaction can help identify areas for improvement.

Additional Analysis

To gain deeper insights, the following analyses could be conducted:

- **Delinquency Analysis:** Compare delinquency rates for verified and non-verified borrowers, as well as by loan purpose and borrower demographics.
- **Loan Size Analysis:** Analyze trends in loan size over time and by loan purpose.
- **Customer Segmentation Analysis:** Identify distinct customer segments based on demographic, financial, and behavioral characteristics.
- **Geographic Analysis:** Analyze loan performance and borrower characteristics by region to identify geographic trends.
- **Competitive Analysis:** Compare the organization's loan products, rates, and terms to competitors in the market.

Conclusion

This dashboard provides valuable insights into the financial performance of the organization's loan portfolio. By leveraging these insights and conducting further analysis, the organization can make data-driven decisions to improve risk management, product offerings, and customer satisfaction.



Bank Loan Performance Analysis

Interpretation



Analysis of Loan Performance:

- ❖ **January** had the highest percentage of fully paid loans.
- ❖ **Home loans** dominated loan amounts in **March and June**.
- ❖ In **April**, current and fully paid loans contributed almost equally to total payments.
- ❖ **July** saw a significant portion of total payments from grace period loans.
- ❖ **September and December 2021** had lower total installment payments compared to the previous year.
- ❖ **October** had an unusually high total funded amount, while **November** had a lower fully paid loan percentage.

The Following Tips helps to Improve Performance:

- ❖ **Replicating successful tactics:** Copying strategies that worked well in January.
- ❖ **Prioritizing home loans:** Focusing on home loans during peak demand months of March and June.
- ❖ **Balancing payments:** Ensuring a more even distribution of loan payments in April.
- ❖ **Reviewing grace periods:** Examining the terms of grace periods offered in July.
- ❖ **Investigating declines:** Analyzing the reasons for decreased performance in September and December.
- ❖ **Preparing for high demand:** Anticipating and addressing increased demand in October.
- ❖ **Providing support:** Offering assistance to borrowers in November to improve their performance.



Bank Loan Performance Analysis



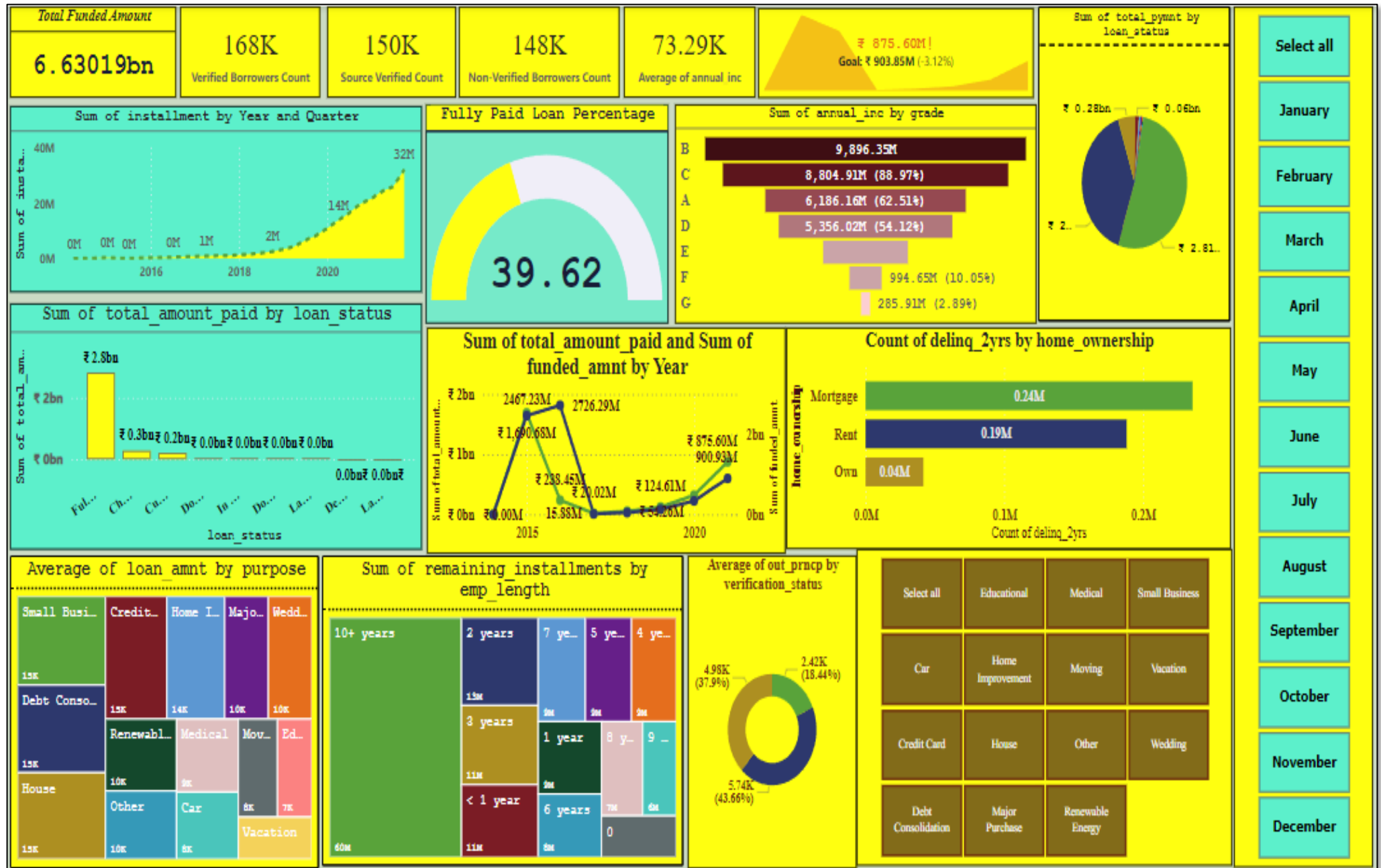
Analysis of Borrower Profile:

- ❖ **Car loans:** Borrowers have an average annual income of \$77.32K.
- ❖ **Credit card loans:** KPIs are 6.4% below the target.
- ❖ **Credit consolidation loans:** Have a high number of non-verified borrowers.
- ❖ **House loans:** KPIs are 31.62% below the target.
- ❖ **Moving loans:** Have a high verification rate.
- ❖ **Small business loans:** Mostly have remaining installments for employees with a length of 5 years.
- ❖ **Wedding loans:** Have a maximum remaining installment period of over 1 year.

The Following Tips helps to Improve Performance:

- ❖ **Address credit card KPI loss:** Identify and mitigate key risk factors.
- ❖ **Enhance verification:** Improve verification processes for credit consolidation loans.
- ❖ **Boost house loan KPIs:** Prioritize strategies to increase performance.
- ❖ **Leverage moving loan verification:** Use as a model for other loan categories.
- ❖ **Offer flexible installment plans:** For small business loans.
- ❖ **Ensure manageable terms:** For wedding loans.

Overall Dashboard for Bank Loan Performance Analysis



Average of loan_amnt by purpose

Purpose	Average of loan_amnt
Small Busi	15K
Credit	15K
Home I	14K
Majo	10K
Wedd	10K
Debt Conso	15K
Renewabl	10K
Medical	5K
Mov	5K
Ed	7K
House	15K
Other	10K
Car	5K
Vacation	7K

Sum of remaining installments by emp_length

Emp Length	Sum of remaining installments
10+ years	40M
2 years	15M
7 ye	5M
5 ye	5M
4 ye	5M
3 years	11M
1 year	5M
8 y	7M
9	6M
< 1 year	11M
6 years	5M
0	0

Average of out_prncp by verification_status

Select all

Educational

Medical

Small Business

Car

Home Improvement

Moving

Vacation

Credit Card

House

Other

Wedding

Debt Consolidation

Major Purchase

Renewable Energy

Select all

January

February

March

April

May

June

July

August

September

October

November

December